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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PHAN, THIEM D

ART UNIT

PAPER NUMBER

3729

DATE MAILED: 11/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/698,817

Applicant(s)

THERIAULT ET AL.

Examiner

Tim Phan

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 9-18, 30 and 40-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 19-29 and 31-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 & 11 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicants' letter filed on or about 15 September 2003 with regard to *Election/Restriction* has been duly reviewed. The Restriction mailed on or about 11 July 2003 has been withdrawn for a new Restriction.

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-5, 19-24, 31-33 and 6, 25, 34-36 and 7, 8, 26-29, 37-39, drawn to an apparatus for placing components on printed circuit boards, classified in class 29, subclass 729;
- II. Claims 9-18 and 30, drawn to a method of mounting electronic components on a printed circuit board, classified in class 29, subclass 832;
- III. Claims 40-44, drawn to a method of handling electronic components for printed circuit boards, classified in class 29, subclass 854.

3. The inventions are distinct, each from the other because of the following reasons:

Inventions (II and III) and (I) are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced

by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process of installing electronic components on printed circuit boards can be done by hand.

Inventions III and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the method of making handling electronic components for printed circuit boards as recited in Group III does not require a component placement system for taking components from the component storage area thereof, as required by Group II. The subcombination, Invention II, has separate utility such as preventing moisture from being absorbed by the components which are originally stored in dry atmosphere area.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Art Unit: 3729

During a telephone conversation and emails exchange with Christopher Cronin (708-579-7925) on Thursday, 13th November 2003 a provisional election was made to prosecute the invention of Group I, claims 1-5, 19-24, 31-33 and 6, 25, 34-36 and 7, 8, 26-29, 37-39.

Affirmation of this election must be made by applicants in replying to this Office action. Claims 9-18, 30 and 40-44 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicants are advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Applicants are required to cancel these non-elected claims (9-18, 30 and 40-44) or take other appropriate action.

Applicants are reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

An Office Action on the merits of Claims 1-5, 19-24, 31-33 and 6, 25, 34-36 and 7, 8, 26-29, 37-39 now follows.

Title

4. The following title is suggested: "An Apparatus For Maintaining A Dry Atmosphere In A Surface Mount Device Placement Machine".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2-5, 19, 20, 31, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ochoa et al (US 6,054,682) hereinafter '682.

As applied to claims 1, 19, 20 and 32 the '682 teaches the claimed invention, including:

- a component storage area (Cf. fig. 4, element 101; column 4, lines 35-36) which is a thermal chamber heated up for dryness or water vapor removal (Cf. column 4, line 23),
- a component placement system for taking components from component storage area and placing them on printed circuit boards or pick and place machine (Cf. column 4, line 34),

Art Unit: 3729

- an enclosure surrounding the component storage area where the components chamber must be enclosed in order to be heated up (Cf. fig. 4, element 111; column 4, line 33, lines 35-36),
- a dry gas delivery system to storage area to maintain a dry atmosphere and to prevent moisture from being absorbed by the components, that utilizes heating, vacuuming and inserting inert gas in the components chamber to get rid of the water vapor (Cf. column 4, lines 61-66), including deionized air (Cf. column 9, line 1, lines 7-8), except for heat-dry the component storage area without baking the components.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to heat-dry the component storage area without baking the components, since applicants have disclosed that the dry gas in the component storage area is heat-without-baked up to 60 degree Celsius (Cf. Applicants' disclosure, page 6, line 16) and it was known in the art that the component storage room is also heat-without-baked from 50 degree Celsius (Cf. column 6, line 32).

As applied to claims 2-5, the '682 teaches the components fed to PCB placement machine in parts trays, parts in a tape or reel and loose parts in a tube or sticks (Cf. column 1, lines 19-20), specially with the bulk storage of reels to optimize manufacturing (Cf. fig. 4, element 101; column 6, lines 44-48).

Art Unit: 3729

As applied to claim 31, the '682 teaches the claimed invention except for providing the percentage value of 0.1% or more of the components weight to be removed by dry gas.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the percentage value of 0.1% or more of the components weight to be removed by dry gas since it was known in both the applicants' disclosure and the art that the main invention relates to removing water vapor trapped in the integrated circuit packages (Cf. '682, column 1, lines 7 & 8).

As applied to claim 33, the '682 teaches the nitrogen as dry inert gas (CF. column 9, line 33).

7. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '682 in view of Vander Velde (USPN 5,365,779) hereinafter '779.

As applied to claim 21 and 24, the '682 teaches a system for reducing water vapor in integrated circuit packaging, which reads on applicants' claimed limitations.

The '779 teaches the delivery or flow rate and pressure of dry non-corrosive gas without heat to be controlled by a regulator (Cf. column 5, lines 21-22) in order to monitor an optimized flow rate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the references of drying out at different flow

rate the moisture from an enclosed area by a regulator rather than the bodily structure as taught by the '779 in order to efficiently dry out the storage component chamber without heating it up or exerting too much pressure and wasting energy on the gas dry blower by slowing down the dry air flow rate when the air flow is obstructed.

As applied to claims 22 and 23, the '682 and '779 teach the claimed invention of drying the components chamber without heat except for adding several inlets with sprayer for dry airflow in the chamber.

It would have been a mere matter of design choice to add several dry gas inlets to the components chamber and it appears that the invention would perform equally well with single large dry gas inlet with continuous feedback control, sensor for humidity and dry gas flow regulator for monitoring the vapor level in the components chamber.

8. Claims 6, 25, 34, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '682 in view of the '779.

As applied to claims 6, 25 and 35, the '682 teaches a system for reducing water vapor in integrated circuit packaging, which reads on applicants' claimed limitations, including the component storage room heat-without-baking from 50 degree Celsius (Cf. column 6, line 32).

The '779 teaches a system (Cf. fig. 1; column 5, lines 9-32) that supplies non-corrosive dry gas without heat (Cf. fig. 1, element 24; column 8, lines 32-37) to the inlet port (Cf. fig. 1, element 20) of a prestressing element (Cf. fig. 1, element 16) lay inside and along the concrete structure (Cf. fig. 1, element 14), samples at the outlet (Cf. fig. 1, element 26) of that conduit the

humidity level with a moisture sensor (Cf. fig. 1, element 30) and uses the feedback to control the flow rate of dry gas in order to evaluate the humidity level or corrosion of that concrete structure and dry it out through continuous non-corrosive dry gas flow (Cf. column 4, lines 12-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the reference of drying out the moisture from an enclosed area rather than the bodily structure as taught by the '779 in order to facilitate and improve the treatment of moisture problem in the component packaging without heating then avoiding any "popcorn effect" (Cf. the '682, column 4, line 1).

As applied to claim 34, the '682 teaches the claimed invention except for providing the percentage value of 0.1% or more of the components weight to be removed by dry gas.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the percentage value of 0.1% or more of the components weight to be removed by dry gas since it was known in both the applicants' disclosure and the art that the main invention relates to removing water vapor trapped in the integrated circuit packages (Cf. '682, column 1, lines 7 & 8).

As applied to claim 36, the '682 teaches the nitrogen as dry inert gas (CF. column 9, line 33).

Art Unit: 3729

9. Claims 7, 8, 26-29, 37, 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '682 in view of the '779.

As applied to claims 7, 8, 26-29 and 38, the '682 teaches a system for reducing water vapor in integrated circuit packaging, which meets all of applicant's claimed limitations, including the component storage room heat-without-baking from 50 degree Celsius (Cf. column 6, line 32).

The '779 teaches that the flow rate and pressure of dry non-corrosive gas without heat is controlled by a regulator (Cf. fig. 1, element 32; column 5, lines 21-22) to monitor the flow rate and the humidity level sensor (Cf. fig. 1, element 30), thus an unobstructed flow or first flow of dry gas through the open components chamber is always higher than a blocked one or second flow of dry gas through a closed chamber to the component storage area.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two teachings by applying the references of drying out at different flow rate the moisture from an enclosed area by a regulator rather than the bodily structure as taught by the '779 in order to efficiently dry out the storage component chamber without exerting too much pressure and wasting energy on the gas dry blower, only by slowing down the dry air flow rate when the airflow is obstructed.

As applied to claim 37, the '682 teaches the claimed invention except for providing the percentage value of 0.1% or more of the components weight to be removed by dry gas.

Art Unit: 3729

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the percentage value of 0.1% or more of the components weight to be removed by dry gas since it was known in both the applicants' disclosure and the art that the main invention relates to removing water vapor trapped in the integrated circuit packages (Cf. '682, column 1, lines 7 & 8).

As applied to claim 39, the '682 teaches the nitrogen as dry inert gas (CF. column 9, line 33).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 703-605-0707. The examiner can normally be reached on M - F, 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3729

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

TP

Tim Phan
Examiner
Art Unit 3729

tp
November 14, 2003

Cja
CARL J. ARBES
PRIMARY EXAMINER